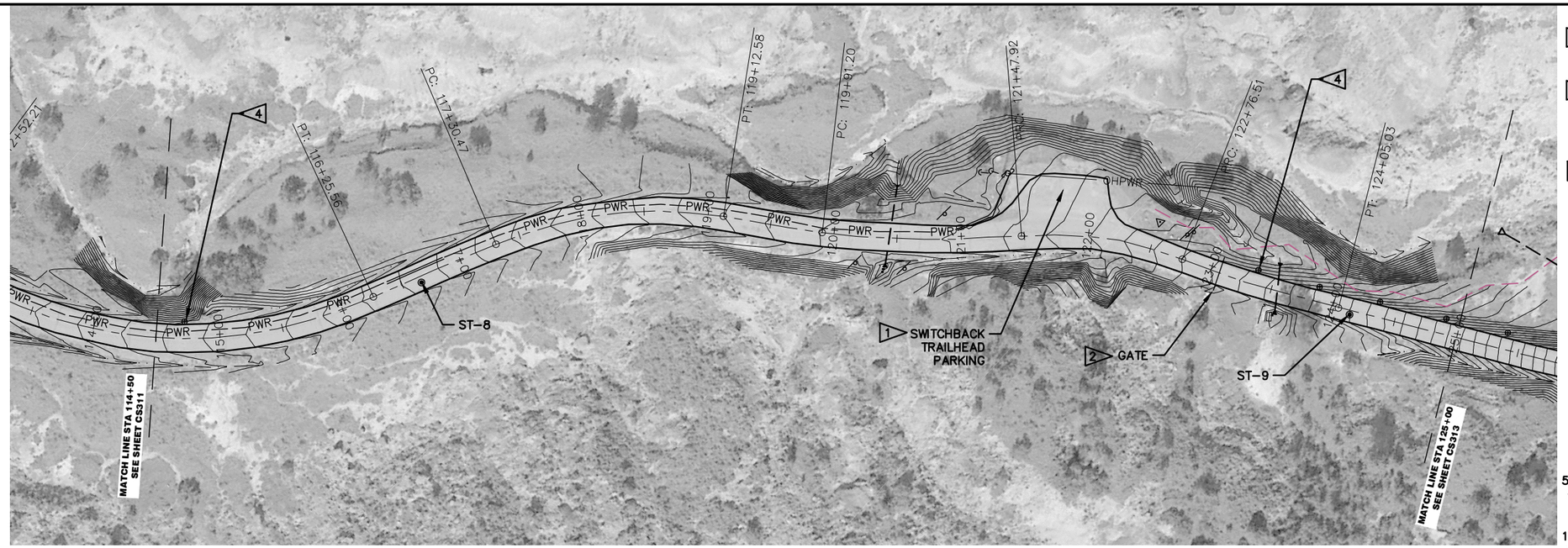


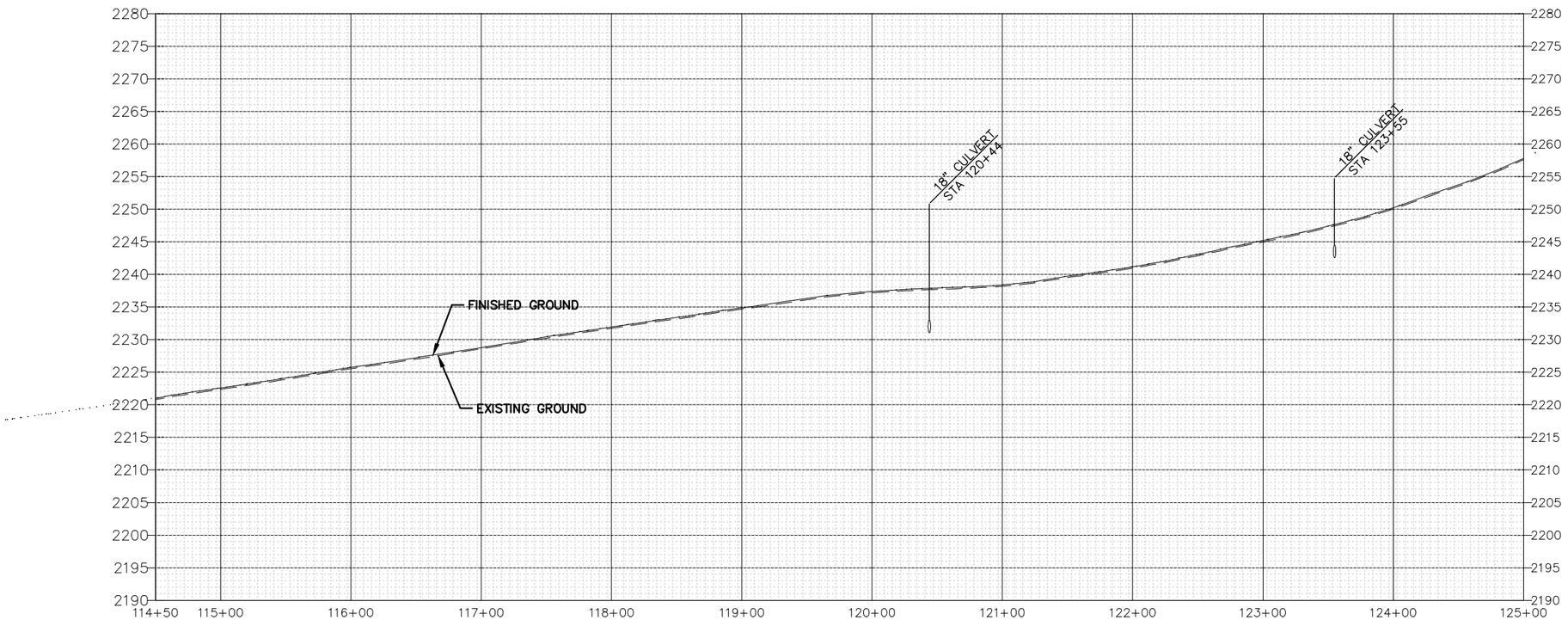
CONSTRUCTION NOTES:

1. STA. 121+00 TO 122+50 WIDER TYPICAL SECTION APPLIES TO ROAD PULLOUT.
2. DO NOT DISTURB.
3. STA 123+00 TO END OF PROJECT IS ACTIVE SLOPE. SEE SPEC.
4. REMOVE AND REPLACE EXISTING DELINEATORS (TYP OF 5).
5. UTILITY DEPTHS FROM PAST AS-BUILT DRAWINGS AVAILABLE FROM ENGINEER. CONTRACTOR TO FIELD VERIFY (TYP ALL LOCATIONS).

HORIZONTAL
50 0 50 100
(SCALE IN FEET)

VERTICAL
10 0 10 20
(SCALE IN FEET)

MAKOSHIKA STATE PARK ROAD



RPA

SYM.	REVISION	BY	APPR.	DATE

R. MORTON, PE — DESIGNED BY
G. LESOFSKI — DRAWN BY
J. KEY, PE — CHECKED BY
JUNE 2018 — DATE
17353 — PROJECT NO.
P&Ps-MAKOSHIKA — FILE

PROJECT TITLE
MAKOSHIKA STATE PARK ROAD INFRASTRUCTURE REPAIRS
Glendive, Montana

SHEET TITLE
MAKOSHIKA ROAD PLAN AND PROFILE STA 114+50 TO 125+00

SHEET
CS312
30 OF 37

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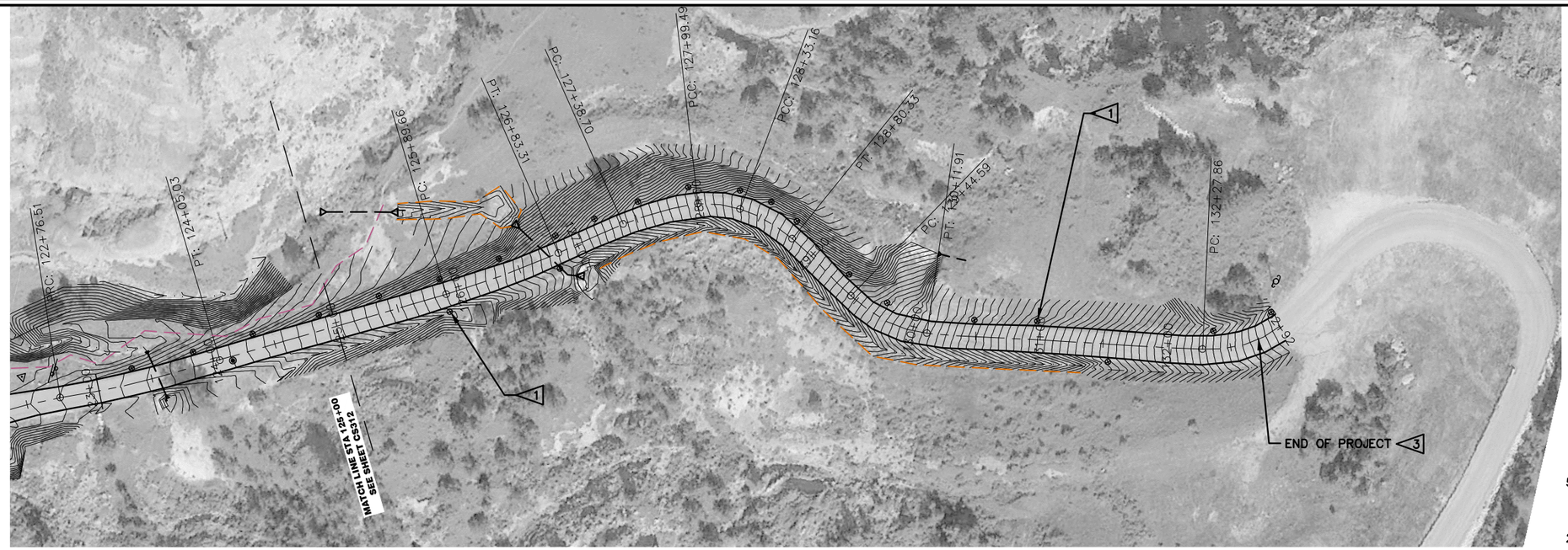
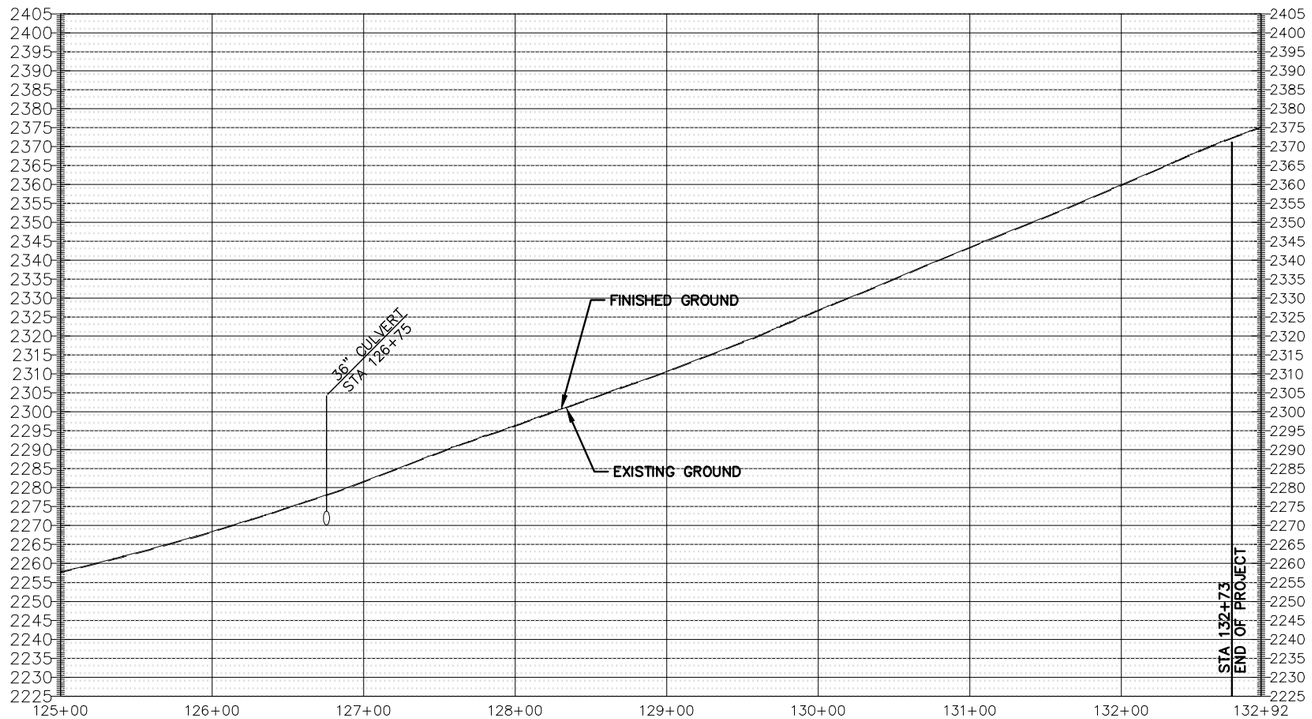


CONSTRUCTION NOTES:

1. REMOVE AND REPLACE EXISTING DELINEATORS. TYP.
2. STA 123+00 TO END OF PROJECT IS ACTIVE SLOPE. SEE SPEC.
3. SAW CUT AND MATCH EXISTING GRADE.
4. END OF PROJECT LOCATION TO BE FIELD VERIFIED WITH ENGINEER.

HORIZONTAL
50 0 50 100
(SCALE IN FEET)
VERTICAL
20 0 20 40
(SCALE IN FEET)

MAKOSHIKA STATE PARK ROAD



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R. MORTON, PE — DESIGNED BY
G. LESOFSKI — DRAWN BY
J. KEY, PE — CHECKED BY
JUNE 2018 — DATE
17353 — PROJECT NO.
P&Ps-MAKOSHIKA — FILE

PROJECT TITLE
MAKOSHIKA STATE PARK ROAD
INFRASTRUCTURE REPAIRS
Glendive, Montana

SHEET TITLE
MAKOSHIKA ROAD
PLAN AND PROFILE
STA 125+00 TO 132+92

SHEET
CS313
31 OF 37

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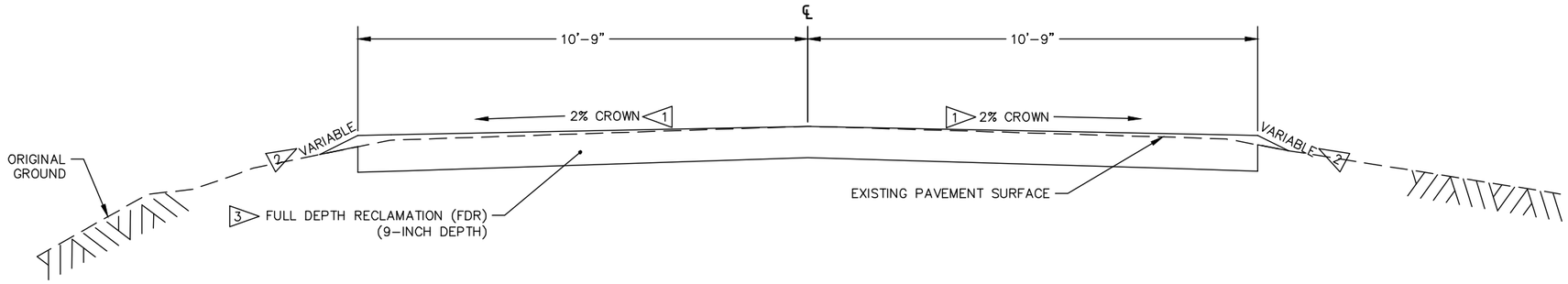
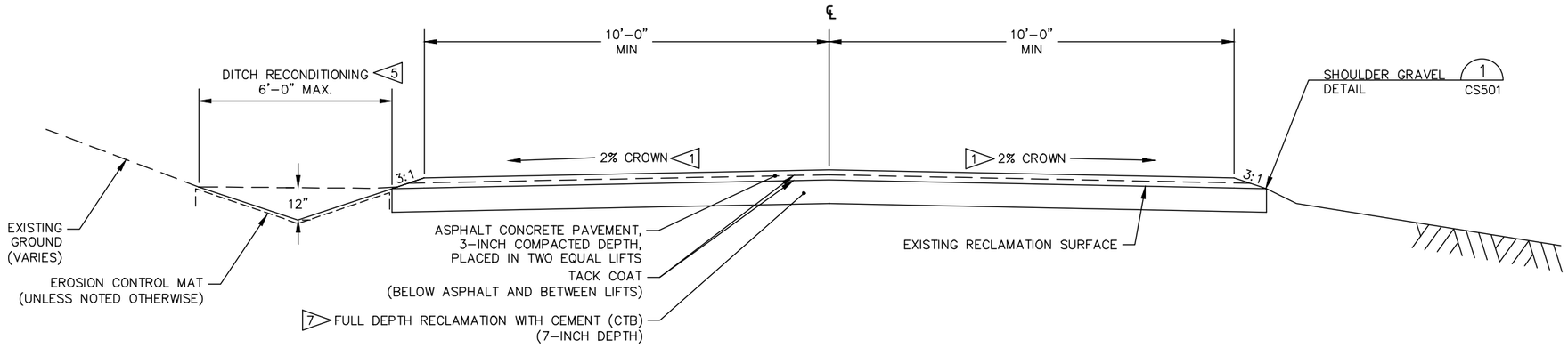
RPA



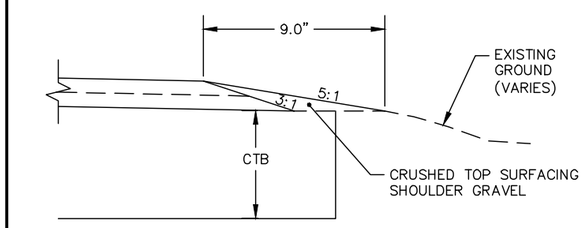
TYPICAL SECTION NO. 1 (STEP 1 - FDR)



TYPICAL SECTION NO. 1 (STEP 2 - CTB W/ ACP) 4 8

NOTES:

1. MATCH EXISTING ROADWAY SUPERELEVATION ON CURVES AS APPROVED. 1.0% MINIMUM, 2.0% MAX CROWN.
2. ADJUST TO MEET FIELD CONDITIONS AS APPROVED. CONSTRUCT NO STEEPER THAN 1:2.
3. COMPLETE ACCORDING TO FHWA F–14 SECTION 305 (SEE SPEC).
4. CONSTRUCT TO TYPICAL SECTION NO. 1 STEP 1–FDR PRIOR TO COMPLETING THIS WORK.
5. RECONDITION DITCH WHERE SPECIFIED IN PLANS AND AS DIRECTED BY ENGINEER. SEE CG SHEETS. GRADE INVERT TO DRAIN TYP.
6. WHERE DIRECTED BY THE ENGINEER, ADD SHOULDER GRAVEL TO THE EDGE OF THE COMPLETED OVERLAY TO LIMIT EDGE DROP OFF.
7. MATCH WIDTH TO EXISTING EDGE OF ROAD.
8. STATIONING OF TYPICAL SECTION TO BE DETERMINED IN FIELD. SEE SPEC.



SHOULDER GRAVEL DETAIL 1 6
(TYP BOTH SIDES) CS501

SYM.	REVISION	BY	APPR.	DATE

R. MORTON, PE — DESIGNED BY
G. LESOFSKI — DRAWN BY
J. KEY, PE — CHECKED BY
JUNE 2018 — DATE
17353 — PROJECT NO.
CS501-CS502 — FILE

PROJECT TITLE
MAKOSHIKA STATE PARK ROAD INFRASTRUCTURE REPAIRS
Glendive, Montana

SHEET TITLE
TYPICAL ROAD SECTIONS

SHEET
CS501
32 OF 37

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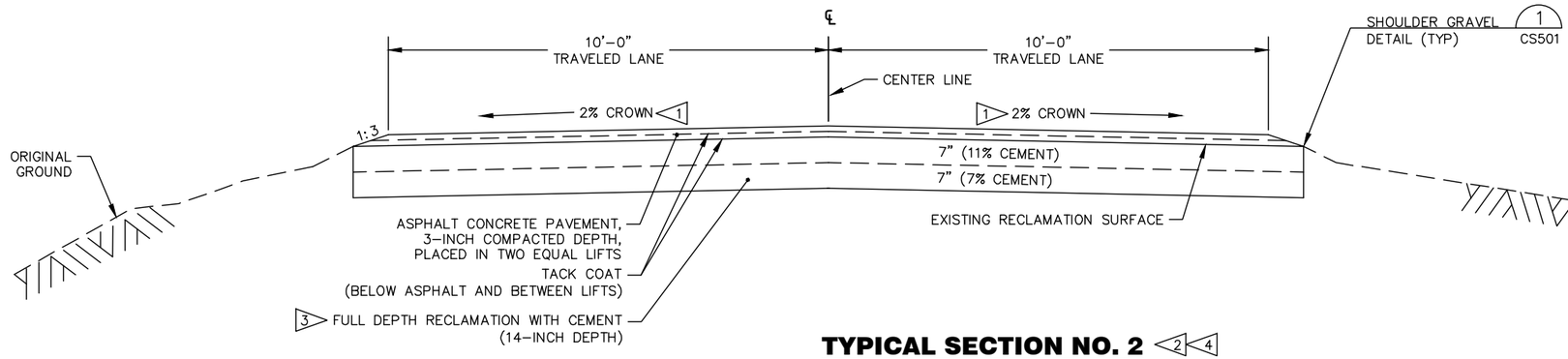
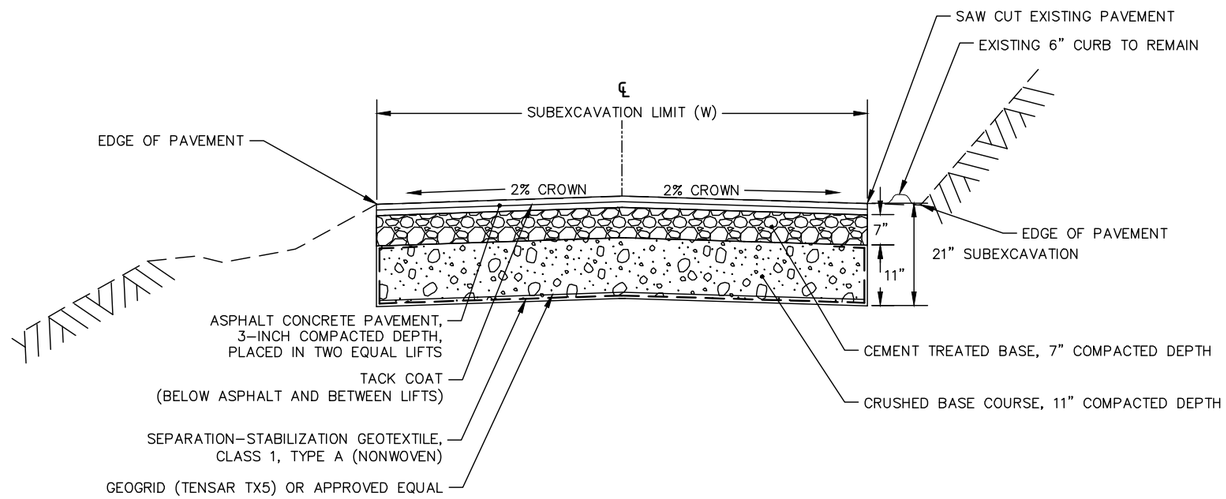


TYPICAL SECTION NO. 2 2 4

NOTES:

1. MATCH EXISTING ROADWAY SUPERELEVATION ON CURVES AS APPROVED, 1.0% MINIMUM, 2.0% MAX CROWN.
2. STATIONING TO BE DETERMINED IN FIELD. SEE SPEC.
3. SOFT AREA FDR WITH CTB.
   BOTTOM 7" AT 7% CEMENT.
   UPPER 7" AT 11% CEMENT.
4. FOR USE AT UNSTABLE AREAS AS APPROVED. SEE SPEC.



SUBEXCAVATION SECTION

SUBEXCAVATION LOCATIONS 1					
STATION TO STATION	WIDTH (W) (FT)	SUBEX LENGTH (FT)	LOCATIONS	TOTAL LENGTH (FT)	REMARKS
SUBEXCAVATION					
99+20 TO 101+10	20	190	1	190	ON CENTERLINE

NOTES:

1. FIELD VERIFY WITH ENGINEER PRIOR TO CONSTRUCTION. ADJUST TO MEET FIELD CONDITIONS AS APPROVED.
2. FOR USE AT UNSTABLE AREAS AS SHOWN.

RPA

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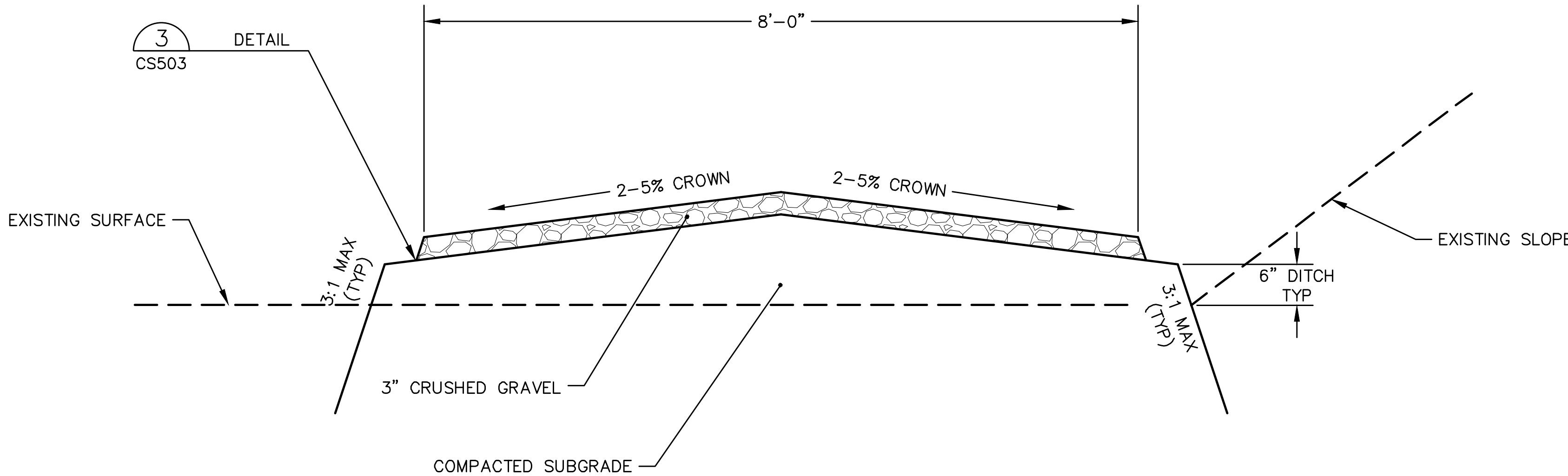
J. KEY, PE — CHECKED BY
JUNE 2018 — DATE
17353 — PROJECT NO.
CS501-CS502 — FILE

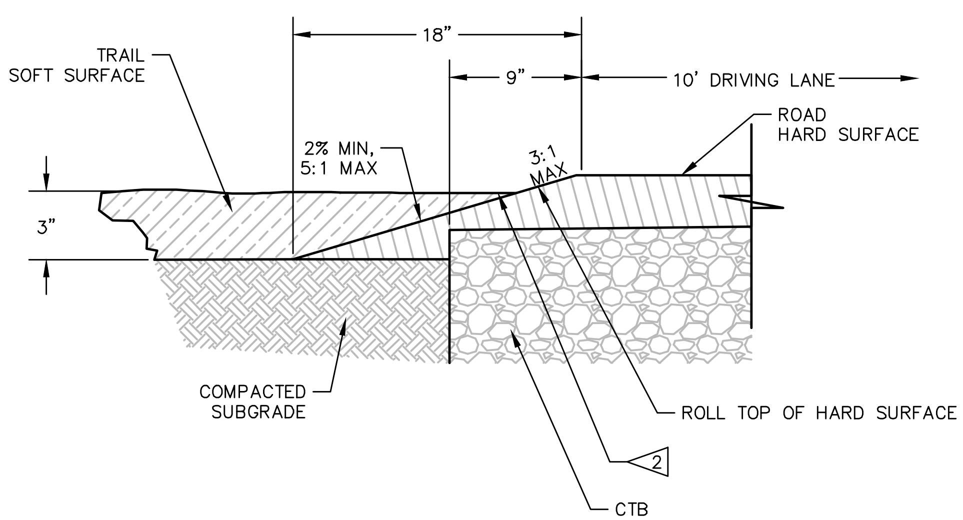
PROJECT TITLE
MAKOSHIKA STATE PARK ROAD INFRASTRUCTURE REPAIRS
Glendive, Montana

SHEET TITLE
TYPICAL ROAD SECTIONS

SHEET
CS502
33 OF 37



TYPICAL TRAIL SECTION (1) CG102,CG103

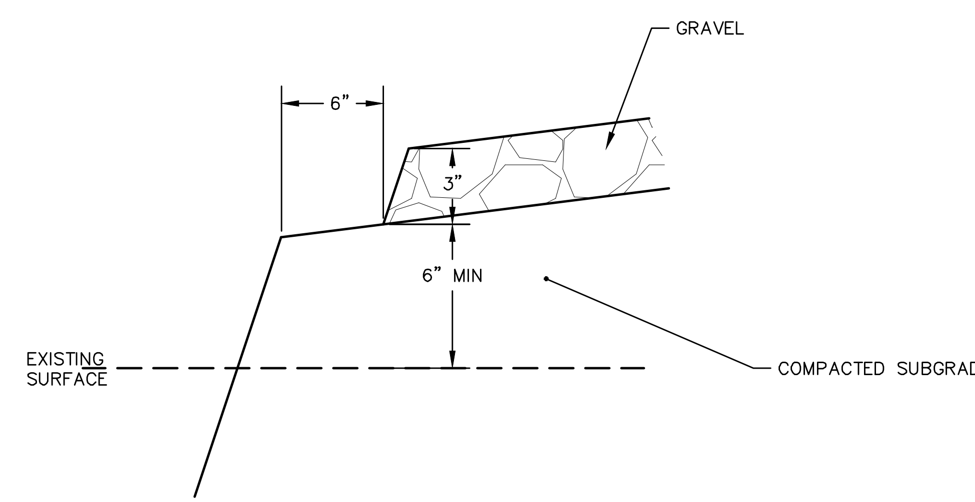


NOTES:

1. TYPICAL ALL ROAD/TRAIL CONNECTIONS

(2) GRADE TO DRAIN.

VANHORN ROLL (2) ~



DETAIL (3) CS503

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RPA

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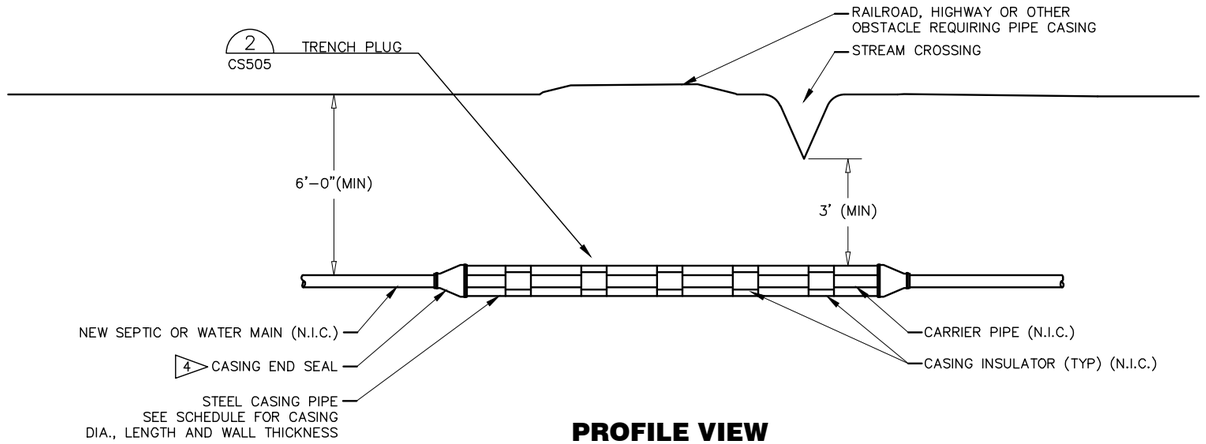
R. MORTON, PE — DESIGNED BY
G. LESOFSKI — DRAWN BY
J. KEY, PE — CHECKED BY
JUNE 2018 — DATE
17353 — PROJECT NO.
CS503 — FILE

PROJECT TITLE
MAKOSHIKA STATE PARK ROAD INFRASTRUCTURE REPAIRS
Glendive, Montana

SHEET TITLE
TYPICAL TRAIL SECTION

SHEET
CS503
34 OF 37



PROFILE VIEW

NOTES:

1. USE JOINT RESTRAINT GASKETS AT ALL PIPE JOINTS INSIDE CASING. (N.I.C.)
2. SACRIFICIAL ANODE SHALL BE INSTALLED AT EACH END OF THE CASING. (N.I.C.)
3. CONTRACTOR MAY INSTALL ADDITIONAL LENGTH OF CASING TO ALLOW FOR CONVENIENCE OF CONSTRUCTION. SUCH ADDITIONAL LENGTH SHALL BE AT NO COST TO THE OWNER.

4 CAP ENDS WATERTIGHT. MARK ENDS W/ 24" REBAR PINS EXPOSED ABOUT 2 INCHES ABOVE GROUND SURFACE.

5. WATER AND SEPTIC LINES REQUIRE MINIMUM 10'-0" SPACING.

CASING SCHEDULE

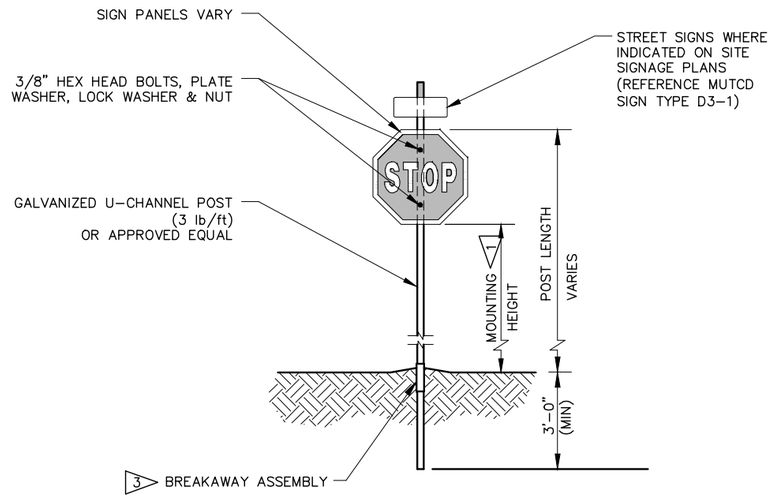
LOCATION	CARRIER PIPE DIA (INCHES)	MINIMUM NOMINAL CASING DIA (INCHES)	MINIMUM CASING WALL THICKNESS (INCHES)	MAXIMUM CASING INSULATOR SPACING INTERVAL *	CASING LENGTH	INSTALLATION METHOD
STA 46+28.8	3" WATER MAIN	8	0.375	10'-0"	40'-0"	OPEN DIG OR BORE & JACK
STA 46+38.8	3" SEPTIC MAIN	8	0.375	10'-0"	40'-0"	OPEN DIG OR BORE & JACK
STA 48+39.3	3" WATER MAIN	8	0.375	10'-0"	40'-0"	OPEN DIG OR BORE & JACK
STA 64+77.2	3" WATER MAIN	8	0.375	10'-0"	40'-0"	OPEN DIG OR BORE & JACK
STA 64+87.2	3" SEPTIC MAIN	8	0.375	10'-0"	40'-0"	OPEN DIG OR BORE & JACK
STA 70+02	3" WATER MAIN	8	0.375	10'-0"	40'-0"	OPEN DIG OR BORE & JACK
STA 70+12	3" SEPTIC MAIN	8	0.375	10'-0"	40'-0"	OPEN DIG OR BORE & JACK

*ONE INSULATOR SHALL BE PLACED NOT MORE THAN 2'-0" FROM EACH END OF THE CASING. SUBSEQUENT INSULATORS SHALL BE PLACED AT THE SPACING INTERVAL INDICATED IN THE TABLE. (N.I.C.)

PIPE CASING DETAILS 1

SCALE: NONE

CS305,CS307



NOTES:

7 WHERE PARKING OR PEDESTRIAN MOVEMENTS OCCUR, THE SIGN SHALL BE MOUNTED WITH A MINIMUM CLEARANCE OF 7'-0" FROM GROUND SURFACE TO BOTTOM OF LOWEST SIGN PANEL.

2. SIGN PANELS SHALL BE OF SHEET ALUMINUM. ALL SIGNS SHALL BE FABRICATED AND CONSTRUCTED IN ACCORDANCE WITH THE MDT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2014 EDITION.

3 ALL SIGNS SHALL BE PLACED WITH BREAKAWAY ANCHOR ASSEMBLY. SEE SPEC.

4. REMOVE AND REPLACE EXISTING SIGNAGE AS NECESSARY FOR CONSTRUCTION. REINSTALL EXISTING AS APPROVED BY ENGINEER. REPLACE DAMAGED SIGNAGE.

TYPICAL SIGN INSTALLATION 2

SCALE: NONE

VERIFY SCALES
BAR SCALE IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

RPA

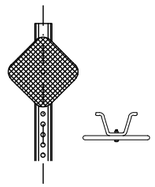
SYM.	REVISION	BY	APPR.	DATE

R. MORTON, PE — DESIGNED BY
G. LESOFSKI — DRAWN BY
J. KEY, PE — CHECKED BY
JUNE 2018 — DATE
17353 — PROJECT NO.
CS504-CS506 — FILE

PROJECT TITLE
MAKOSHIKA STATE PARK ROAD INFRASTRUCTURE REPAIRS
Glendive, Montana

SHEET TITLE
DETAILS

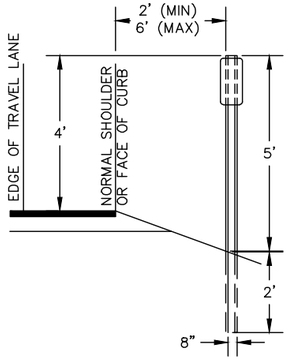
SHEET
CS504
35 OF 37



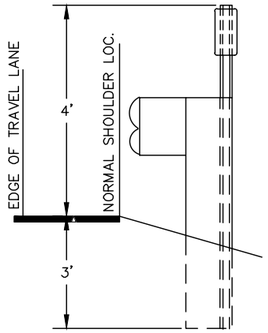
DESIGN A

(WHITE)

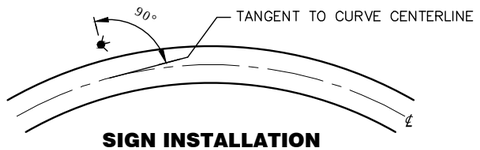
USE FOR DELINEATION ON TANGENTS



TYPICAL INSTALLATION

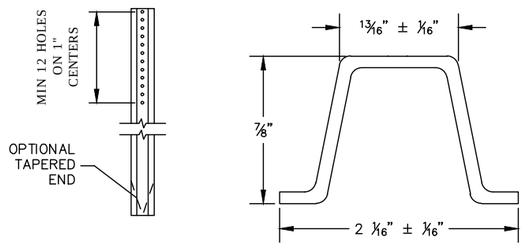


TYPICAL INSTALLATION WITH BEAM TYPE GUARD RAIL



SIGN INSTALLATION ANGLE

PLAN



DELINEATOR POST DETAILS

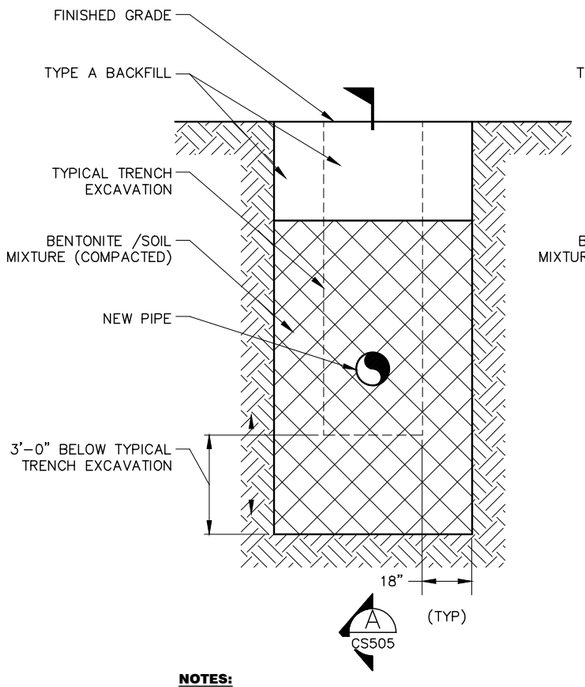
RIGID STEEL OR ALUMINUM

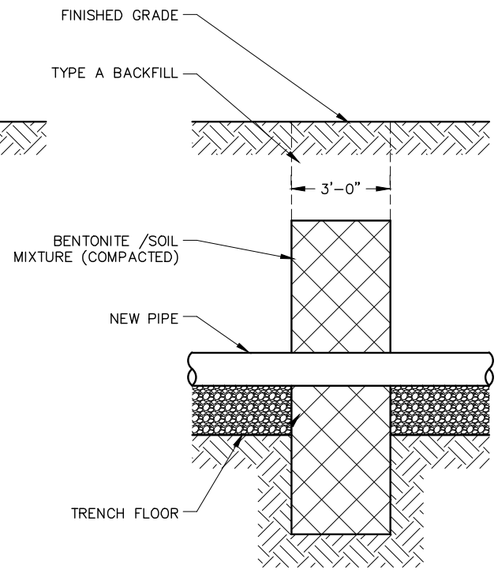
NOTES:

1. WHEN THE CONTRACT DOES NOT INCLUDE THE FINAL SURFACING, ALLOW FOR THE THICKNESS OF THE FINAL PAVEMENT STRUCTURE WHEN ESTABLISHING THE ELEVATION OF THE TRAFFIC DELINEATORS.
2. PLACE DELINEATORS AT A CONSTANT CLEARANCE DISTANCE FROM THE EDGE OF PAVEMENT EXCEPT WHERE GUARDRAIL OR OTHER OBSTRUCTIONS INTERFERE. ALIGN DELINEATORS WITH THE INSIDE EDGE OF OBSTRUCTION. INSTALL DELINEATORS LOCATED BEHIND BEAM GUARDRAIL SO THAT THE DELINEATOR POST IS ADJACENT TO THE TRAILING EDGE OF THE NEAREST GUARDRAIL POST. (SEE TYPICAL INSTALLATION WITH BEAM TYPE GUARDRAIL).
3. WHEN A DELINEATOR FALLS WITHIN A CROSS ROAD OR APPROACH, THE DELINEATOR MAY BE MOVED IN EITHER DIRECTION A DISTANCE NOT TO EXCEED ONE QUARTER OF THE NORMAL SPACING. ELIMINATE THE POST IF THIS ALLOWANCE IS EXCEEDED.
4. MOUNT DELINEATORS ON METAL POSTS WITH 3/16" CADMIUM–PLATED BOLTS. DRILL OR PUNCH A MINIMUM OF TWELVE 3/8" DIAM HOLES ON 1–INCH CENTERS FROM THE TOP OF THE POST. 3/8" SQUARE HOLES MAY BE USED WITH LARGE–HEADED BOLT OR AN APPROPRIATE WASHER. JAM THREADS AFTER TIGHTENING THE NUT TO PREVENT REMOVAL.
5. ALL DELINEATOR REFLECTORS HAVE 3/4" RADII.
6. MANUFACTURE POSTS FROM FLANGED U–CHANNEL SECTIONS OF STEEL MEETING THE REQUIREMENTS OF ASTM A 36 AND WEIGHING NOT LESS THAN 1.25 POUNDS PER FOOT OR ALUMINUM MEETING THE REQUIREMENTS OF ASTM B 221, ALLOY 6061–T6, WITH A MINIMUM THICKNESS OF 0.125 INCHES. AFTER FABRICATION, GALVANIZE STEEL POSTS IN ACCORDANCE WITH ASTM A 123.

VERIFY SCALES
BAR SCALE IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DELINEATOR 1
SCALE: NONE ~





SECTION A
CS505

NOTES:

1. THE PURPOSE OF THE TRENCH WATER STOP IS TO PREVENT TYPE 1 & TYPE 2 BEDDING FROM BECOMING A CONDUIT FOR GROUNDWATER.
2. ALL TRENCH WATER STOPS SHALL BE CONSTRUCTED TO HAVE AN IN–PLACE PERMEABILITY RATE OF 1x10–7 CM/SECOND OR LESS.
3. TRENCH WATER STOPS SHALL BE INSTALLED AT EACH ROAD CROSSING AT A MINIMUM OF 100'–0" APART, AND CROSSINGS OF STREAMS, DITCHES, OR OTHER SOURCES OF GROUNDWATER. WHEN DIRECTED BY THE ENGINEER, TRENCH WATER STOPS SHALL ALSO BE INSTALLED ALONG SERVICE UTILITY TRENCHES.
4. SEE PIPE BEDDING DETAILS ON SHEET CS506.

TRENCH PLUG 2
SCALE: NONE CS504

RPA

SYM.	REVISION	BY	APPR.	DATE

R. MORTON, PE — DESIGNED BY
JUNE 2018 — DATE
G. LESOPSKI — DRAWN BY
17353 — PROJECT NO.
J. KEY, PE — CHECKED BY
CS504-CS506 — FILE

PROJECT TITLE
MAKOSHIKA STATE PARK ROAD INFRASTRUCTURE REPAIRS
Glendive, Montana

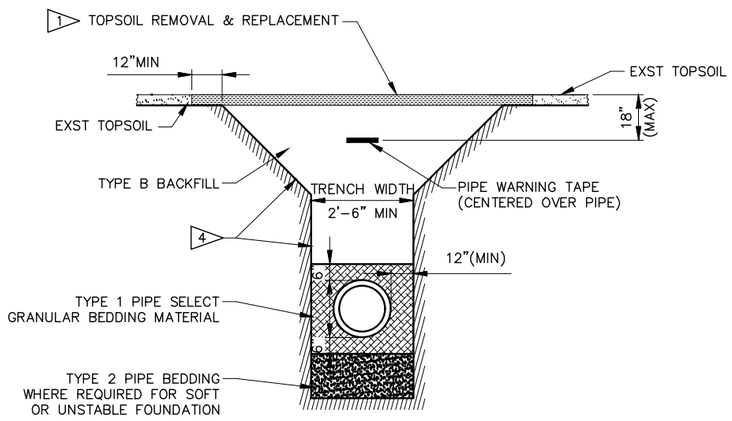
SHEET TITLE
DETAILS

SHEET
CS505
36 OF 37

F:\rnd\rres\17353 – FWP Makoshika\Makoshika–C3D\Cadd\Sheets\CS504–CS506.dwg Jun 04, 2018

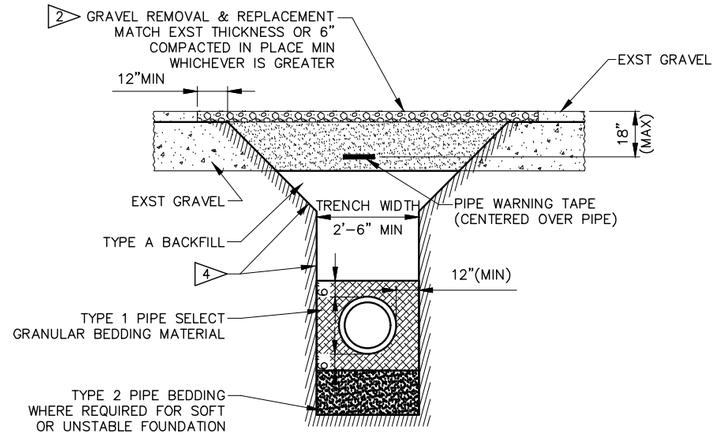
NOTES:

1. WHERE TRENCH PASSES THROUGH TOPSOIL; THE TOPSOIL SHALL BE REMOVED A MIN OF 12" FROM THE EDGE OF THE TRENCH OPENING.
2. WHERE TRENCH PASSES THROUGH EXISTING GRAVEL; THE GRAVEL SHALL BE REMOVED A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING.
3. WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT; THE PAVEMENT SHALL BE CUT ALONG A NEAT VERTICAL LINE A MINIMUM OF 12" FROM THE EDGE OF THE TRENCH OPENING.
4. TRENCH SHALL BE CONSTRUCTED TO OSHA SPECIFICATIONS FOR EXCAVATION, SECTION 1926, SUBPART P.
5. ALL SPOILS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED LOCATION.
6. SEE SPECIFICATIONS FOR COMPACTION REQUIREMENTS.
7. ALL ROCKS GREATER THAN 12" IN ANY DIMENSION SHALL BE HAULED OFF SITE AND PROPERLY DISPOSED OF.
8. SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS WHICH ARE NOT PAVED, CONCRETED, OR SODDED.
9. NO ROCKS OR LUMPS LARGER THAN 2" IN ANY DIMENSION SHALL BE ALLOWED WITHIN 6" OF THE PIPE.



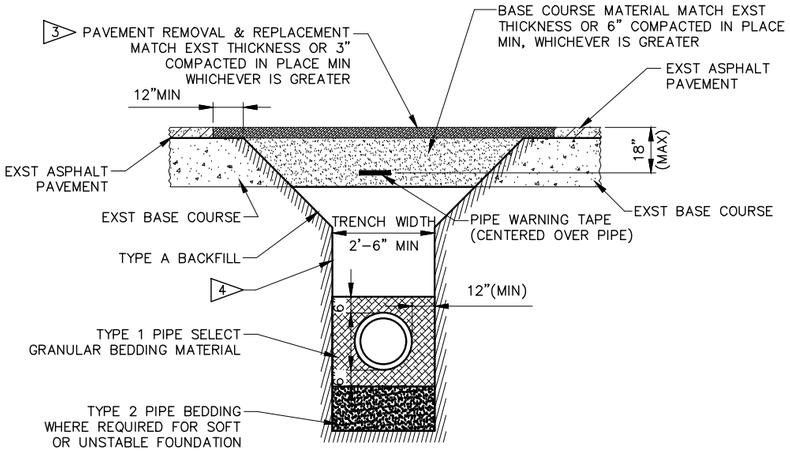
PIPE BEDDING AND BACKFILL-UNFINISHED SURFACE

SCALE: NONE



PIPE BEDDING AND BACKFILL-GRAVELED SURFACE

SCALE: NONE



PIPE BEDDING AND BACKFILL-PAVED SURFACE

SCALE: NONE

VERIFY SCALES
BAR SCALE IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

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Glendive, Montana

SHEET TITLE
PIPE BEDDING AND BACKFILL

SHEET
CS506
37 OF 37

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